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ABSTRACT

Communications satellite technology has for the first time given Alaska the capacity to deliver television broadcasts to the state's isolated regions. The ATS-6 Health/Education Telecommunications Experiment has given the state an opportunity to: (1) acquire experience with new forms of technology; (2) involve the state's culturally diverse minorities in the selection of programing; and (3) provide educators with experience in developing materials for use in rural communities. All-weather ground terminals have been installed, and nearly 100 hours of original programs were created and broadcast. Because of the potentially dramatic impact the broadcasts could have on village life, care has been taken to involve community councils in all stages of decision making. A full external evaluation of the program will be forthcoming. (EMH)

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ALASKA ATS-6

HEALTH/EDUCATION TELECOMMUNICATIONS

EXPERIMENT

ALASKA EDUCATION EXPERIMENT

FINAL REPORT

EXECUTIVE SUMMARY

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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September 30, 1975

IR 002 691

The Office of Telecommunications, Office of the Governor of the State of Alaska, has prepared this Final Report under terms of Contract 400-75-0002 with the National Institute of Education, U.S. Department of Health, Education and Welfare.

The opinions expressed in this Report are those of the Office of Telecommunications, presented in an effort to provide guidelines for others faced with similar procedural and management decisions.

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I. INTRODUCTION

I. INTRODUCTION

Alaska is a state of extremes. Fewer than 350,000 people live in 265 communities scattered throughout Alaska's 586,400 square miles. Most of these communities are small and rural; forty percent have populations of less than 1,000. Most of the smaller villages in Alaska are also remote; two-thirds are not on any connecting highway system. In these isolated areas transportation is limited to air or water travel. In the 45 villages without airstrips transportation is even more limited, when fall freezeup and spring breakup prevent either float or ski-planes from landing on rivers.

Alaska has the most extreme climate of any state in the United States, ranging from southeastern rain forest to desolate Arctic tundra. One-third of the state is north of the Arctic Circle, and winter temperatures can be quite extreme.

Adding to the isolation of the state's rural areas is Alaska's poor communications system. HF radio provides the only communications link in many villages, but changing atmospheric conditions make this network unreliable. Telephone service is provided to some rural communities, with much variation in both type, cost and quality of service. Circuits are typically overcrowded, especially in smaller villages having only one telephone for all to share.

AM and FM radio exist primarily in Alaska's larger cities. The six public broadcasting facilities in the state serve 16% of the population. The commercial, public, military and cable television distribution systems provide service to Alaska's urban areas. Virtually all programming on all systems is video-taped or filmed and played back on a one-week or more delayed basis.

The cultural diversity in Alaska is also extreme. Eskimos, Aleuts and Indians (Athabaskan, Thlinget, Haida and Tsimshian) together comprise 17% of the total state population. Three-fourths of these Native Alaskans live in approximately 175 small, rural villages with 25 or more residents. Numerous traditional languages are still spoken in many villages, and those who speak one language or dialect cannot always readily understand those who speak another.

Life in Alaska's villages can be hard. Year-round jobs are scarce, incomes are very low, and the cost of living is high. Many still rely on food-gathering for subsistence. It is in these small, isolated communities that the most serious problems of education and health persist.

Health care is a major problem in Alaska's rural areas. Medical service in most villages is limited to local health aides, working under the direction of a physician from a regional hospital, often quite distant from the individual village.

Educational problems in remote areas of Alaska are also severe. Primarily non-Native, Engligh-speaking teachers provide schooling through the sixth grade in most villages. To continue their education, village students are required to attend regional boarding schools, or move to a larger, more urban community. Many students have almost no frame of reference outside of village life, and find it difficult at best to adjust to more complex urban living.

A wide variety of recent studies have agreed in concluding that a satellite communications system could ideally apply to the comples problems of rural Alaska's isolation. The State of Alaska has seen the ATS-6 satellite experiment as a prime opportunity to explore increased health and educational communications. This experiment

provided the state with its first opportunity for utilizing a prototype operational satellite communications system for the transmission of television and multiple voice channels to low-cost earth stations in rural Alaska.

The sites selected as earth terminals provided the HET experiment with a cross-section of characteristically rural Alaskan problems. Only five are on any existing highway system. Travel to the remaining thirteen is primarily by air or water, weather permitting.

Five of the 10 Athabaskan languages were represented in the satellite footprint, as well as Central Yupik Eskimo. Five communities in the footprint have substantial Thlinget-speaking populations. Some English is spoken with varying degrees of proficiency in all the villages included. Fourteen of the 18 experiment communities could be classed as rural villages, with an average population of less than 250.

Clearly, the challenge of the ATS-6 HET experiment was a unique one. This demonstration served as a model for services which might be made available on an economically feasible basis in the future, and explored the use of advanced communications systems to lessen the negative aspects of living in isolated, rural villages of Alaska.

II. OBJECTIVES

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The ATS-6 HET experiment provided a unique opportunity for the State of Alaska to achieve its objective of gaining from experience the knowledge necessary to make precedent-setting planning decisions on the development, operation and programming of a future statewide operational satellite system.

The State of Alaska's specific objectives for the ATS-6 HET Alaska Education (ALED) experiment were:

1. To install and operate an experimental satellite system to give the state technical experience from which to plan future statewide satellite communications system.

2. To provide educators in the state with experience in the development and production of program materials designed to meet the educational needs of rural Alaska.

3. To involve users in all phases of relevant program content selection and development.

The state's objective was not to determine if a satellite could be useful, but how to most effectively use it. Although it was technically possible prior to this experiment to design satellite-based systems to improve communications in Alaska, a better understanding of likely utilization, acceptance and operation requirements was needed before making any statewide investment of the magnitude required.

This experiment allowed the state to gain specific technical experience with the operation and maintenance of earth terminals, as well as technical satellite interface. The satellite footprint in Alaska provided an identifiable, rural target population for innovative programming experimentation based on identifiable educational needs.

The selection, scheduling and production of programming provided experience in the process of specified educational program development, and the data necessary for determining program requirements and costs.

Alaska's primary interest was not in precisely measuring the instructional efficiency of various programming and dissemination techniques. Rather, the state was exploring effective ways of utilizing the technological resource at hand.

An effective telecommunications system must allow users to generate service requirements, and users must have experience with a system before they can accurately define how it can best meet their needs. A consistent objective of this experiment was to provide users with experience in use of a satellite system as well as with the means to express their own priorities among the variety of applications to be made of a telecommunications satellite system for rural Alaska.

By directly involving users as active participants in this experiment development, interactive, real-time communications led to exploration of techniques valuable in reducing the isolation of remote Alaskan communities. The ALED experiment provided Alaska with an opportunity to test these user-suggested techniques on an experimental basis. This allowed modification of programming for improved effectiveness, which in turn stimulated acceptance by involved users and helped determine the suitability of various operational techniques, potential user demand and operating costs.

III. SYSTEM DESIGN

III. SYSTEM DESIGN

The National Space and Aeronautics Administration (NASA) launched the sixth satellite in its Applications Technology Satellite series, ATS-6, on May 30, 1974. The State of Alaska Governor's Office of Telecommunications (GOT) was one of the experimenters given time on the ATS-6 satellite for technical and operational experimentation.

The ATS-6 satellite was positioned at 94 degrees W. longitude 22,300 miles above the earth's equator in synchronous orbit; it circled the earth every 24 hours, remaining stationary in relation to the earth.

ATS-6, unlike previous satellites, could be accurately stabilized and pointed, and carried high-gain antennas and high-powered transmitters able to communicate with inexpensive, simple ground stations. In the 2.5 GHz range, the two transmitters worked into a 30-foot parabolic reflector to produce a northern and southern beam, forming a "footprint" on the earth, approximately 500 miles long and 300 miles wide.

All satellite communications within Alaska occured on one of the S-band frequencies 2247.5 MHz (transmit) and 2670 MHz (receive). The C-band capability was used by the Network Control Center (NCC) in Denver in its communications with ATS-6 and for monitoring all HET experiment operations.

The ATS-6 ground station network in Alaska included 19 small earth terminals, both intensive (receive-only) and comprehensive (receive and transmit).

The fourteen intensive terminals in Alaska had the capability of receiving video and 4 channels of associated audio, and of two-way voice communications via a VHF channel on the ATS-1 satellite. The equipment necessary for an intensive terminal

consisted of a 10-foot parabolic antenna, outdoor unit, connecting rf cable, indoor unit, video cable, audio cable, and a TV monitor. The cost of an intensive terminal was approximately $8,000.

The five comprehensive terminals in Alaska had the same receive equipment and capabilities as intensive terminals, plus a completely independent transmit terminal with equipment to provide the capacity to transmit video and 4 channels of associated audio. The additional equipment required included a second 10-foot antenna, indoor unit, outdoor unit, and connecting audio and video cable. Video transmit equipment added approximately $50,000 to the cost of a field terminal.

In addition to the ATS-6 video receiving and/or transmitting equipment, each earth terminal had a VHF transmitter and receiver and helical, high-gain directional antenna. This equipment was used in conjunction with the ATS-1 satellite, to provide a single voice channel (149.22 MHz uplink, 135.6 MHz downlink) between each earth terminal in Alaska, ATS Operations Control Center (ATSOCC) and NCC. Original designs called for VHF use to be coordinated by NCC, through digital coordinators at each Alaskan earth terminal. Although installed in Alaska, the necessary equipment was not operational at the time of broadcast start. Direct use of the VHF network by all terminals proved satisfactory for the small Alaskan network, and was retained for the duration of the experiment.

ATS-6 operations were ultimately controlled by ATSOCC located at the Goddard Space Flight Center and affected through the NASA ground stations at Rosman, North Carolina and Mojave, California. During actual transmission of the HET experiments, control of the ground equipment was performed for NASA by the Federation of Rocky

Mountain States (FORMS) at NCC. Alaskan ALED broadcasts originated from either Juneau or Fairbanks, with transmission coordinated by NCC, which interfaced directly with ATSOCC.

IV. SITE SELECTION

IV. SITE SELECTION

The ATS-6 footprint used in the ALED experiment was much smaller than the State of Alaska (Figure 1). Only 63 of the state's approximately 270 communities were within the southeastern, southcentral and interior areas covered by the satellite footprint.

The site selection guidelines outlined in the 1972 Program Plan were:

1. The anticipated significance of satellite technology in meeting the needs of the site.

2. A population large enough (perhaps 150 persons) to develop ample data.

3. The degree of interest shown by prospective participants in having a part of the experiment.

4. The availability of a school, community hall, or other facility suitable for public use.

This 1972 preliminary proposal called for approximately 35 Alaskan communities to be selected. In February 1973, the HET Policy Committee asked all ATS-6 experimenters to determine the fewest number of terminal sites that would result in an effective experiment.

Alaskan ATS-6 project personnel submitted a list in February, setting 12 as the minimum number of Alaskan sites, with 17 "greatly adding to the significance of the project, and any number beyond that adding more."

This established ALED/ATS-6 priority of 17 sites. The Indian Health Service (IHS), participating in medical experiments over ATS-6, also selected its own priority sites. In coordinating the two selections, one medical site (Tanana) was added to the ALED

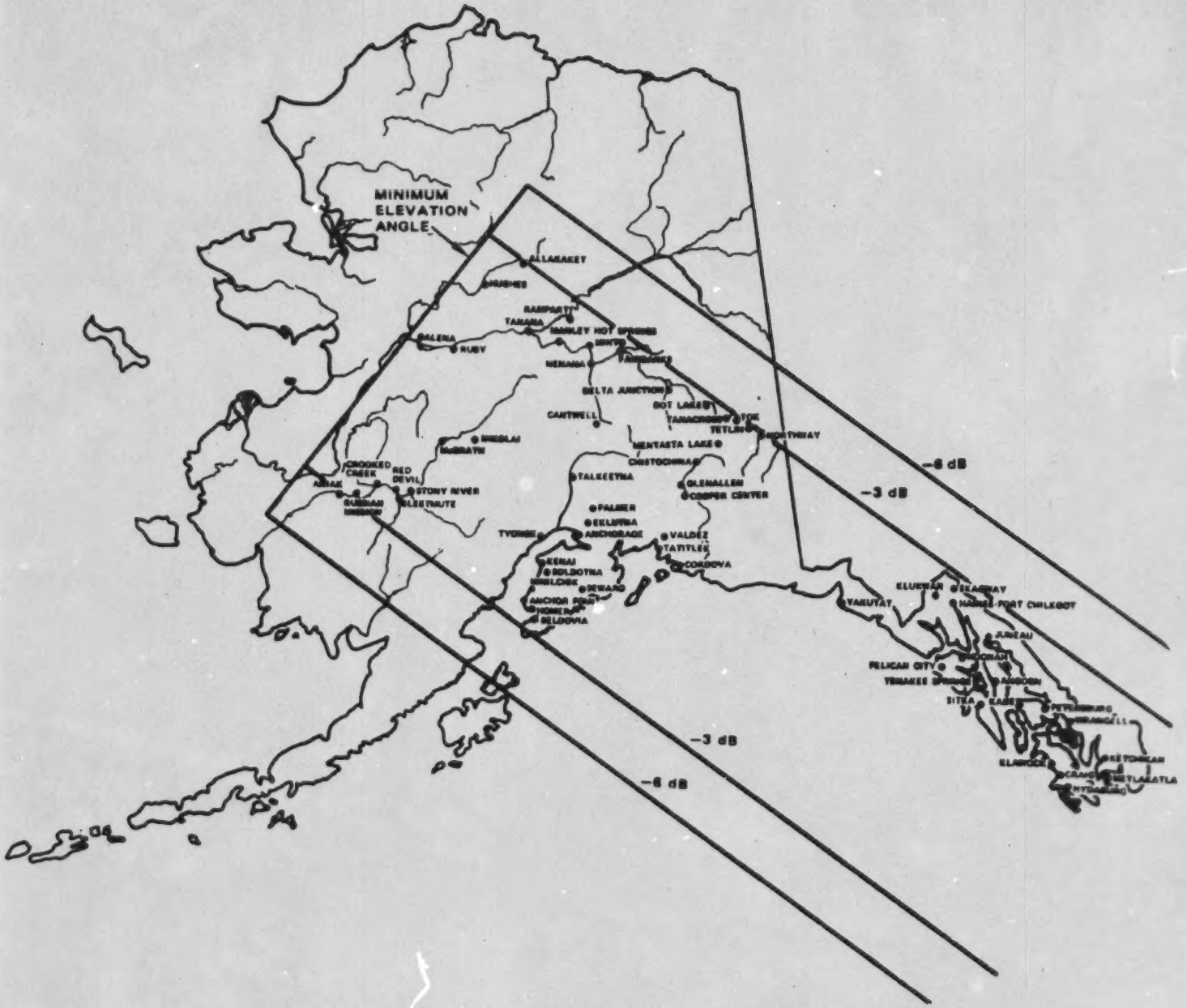

Figure 1. Location of Communities within ATS-6 Footprint.

experiment, and another medical site (Fort Yukon), although outside the ALED ATS-6 footprint, was added to the ALED site list for equipment installation purposes only. This brought the total of ATS-6 HET experiment sites to 19.

Frequency interference problems encountered between NASA and the Department of Defense in late 1972 and early 1973 limited the number of transmit terminals possible in Alaska. IHS requests for transmit capabilities at four sites, and ALED request for transmit capabilities at Fairbanks and Juneau were granted. All Alaska sites were authorized for VHF radio transmit capability via the ATS-1 satellite, as a substitute for audio interaction using ATS-6, as originally planned.

Due to these discovered frequency problems, Alaska was the only HET/ATS-6 experiment location where the S-band or 2250 MHz frequency could be used. Thus Alaska was the only ATS-6 experimenter to fully utilize all capabilities.

Table I gives all selected Alaska ATS-6/HET terminal sites, capabilities and site populations.

TABLE I.
ALASKA ATS-6 EARTH TERMINALS

COMPREHENSIVE	Population
Fairbanks (primary transmission location)	50,312
Juneau (back-up transmission location)	17,356
Tanana	406
Galena	442
Fort Yukon (medical only)	637
INTENSIVE	
Anchorage (metropolitan area)	154,434
Petersburg	2,386
Valdez	2,271
Angoon	400
Nenana	469
McGrath	279
Craig	467
Aniak	273
Yakutat	227
Allakaket	145
Minto	168
Nikolai	82
Sleetmute	109
Chuathbaluk	125

V. INSTALLATION

V. INSTALLATION

The ATS-6 Health/Education Telecommunications experiment required the installation of 19 earth terminals throughout the state. All installation and maintenance costs were funded by contract agreement between GOT and the U.S. Department of Health, Education and Welfare (HEW). The terminal equipment was provided by HEW through a unified procurement program for all ATS-6 users.

Installation and maintenance were accomplished or supervised by GOT personnel. (In Fairbanks, all installation and maintenance was performed by University of Alaska, Division of Media Services subcontract with GOT; Valdez base installation was performed by Glen Mills Construction; and in Valdez and Yakutat installation was accomplished by Wire Communications, Inc., all under the supervision of the GOT Technical Manager.)

The installation and maintenance operation can be divided into six components: 1) site survey; 2) site preparation; 3) equipment delivery; 4) antenna and electronics installation; 5) system testing; and 6) maintenance.

SITE SURVEYS

Preliminary site surveys for equipment placement at each terminal location were performed by the GOT Technical Manager beginning in May and completed in November, 1973.

These surveys consisted of a general description of each community, geographical characteristics affecting satellite reception, possible unobstructed satellite view antenna locations, and any special problems that might be encountered in equipment installation.

All but one intensive terminal was planned for installation at the local school. The intensive terminal in Anchorage was to be installed at the Alaska Native Medical Center. The Fort Yukon, Galena and Tanana comprehensive terminals were planned for installation at the local health clinics, with connecting cable to the school at Tanana for ALED program reception, and a separate intensive terminal at the Galena school. (Fort Yukon did not receive ALED programming.)

The comprehensive terminal in Juneau was planned for installation on the roof of GOT's downtown office building. Fairbanks required two separate terminal installations, the main comprehensive terminal to be located at the University of Alaska, and a second intensive terminal at the Indian Health Service clinic.

SITE PREPARATION

Site preparation was originally planned to be completed prior to the winter months of 1973, to allow rapid installation once equipment began to arrive in Alaska (then anticipated to begin in late fall 1973). This schedule was delayed by winter weather, and other complications at various sites.

The basic element of site preparation was construction of antenna base mounts, which began in October and was completed in November 1973 at five sites. Weather delayed preparation efforts at one site on the Kuskokwim River. Construction at two sites was delayed by the need to obtain Alaska State-Operated School System (ASOSS) permission for roof mounts, and at one site by local ground conditions that required special base construction. All site preparation not completed in the fall of 1973 was accomplished at the time of actual antenna installation.

Standard ground antenna base mounting was possible at eight of the sites, six

required roof mounting, two required raised platforms and three required construction of antenna support boxes with gravel fill.

EQUIPMENT DELIVERY

Firm, advance scheduling of equipment delivery was not possible, and equipment arrived in Alaska sporadically beginning in late December 1973 and continuing through the fall of 1974. GOT proceeded with installation as equipment was delivered. The lack of complete systems ready for installation caused some serious planning problems for GOT technical staff. With limited installation funds, travel and personnel costs increased if incomplete systems were installed, and a return installation trip became necessary to sites. But waiting for complete system delivery reduced the time available for installation prior to satellite broadcast start.

INSTALLATION

Installation began in April 1974. By July, S-band antennas and subsystems had been installed in over half the sites, but many were still not operational, awaiting VHF equipment delivery. Four S-band antennas had still not been received, and transportation difficulties delayed equipment delivery at three sites. With this combination of delays, by July installation was more than two months behind schedule.

VHF equipment and subsystem electronics were delivered and installed in August and September. By September 30, 1974, all but three site terminals had been installed and were operational.

In October an S-band receiver was transferred from Fairbanks to complete Valdez installation. In December, with an S-band antenna still unavailable, Galena became operational with installation of a connecting cable between the health clinic

and the school to provide ALED reception.

Craig continued to experience reception difficulties, and was not operational until March 1975.

Installation costs for all earth terminal sites averaged $5,500.

Installation of Juneau broadcast studio facilities was begun in June and the facility was minimally operational in July, with additional equipment continuing to arrive through the fall of 1974.

SYSTEM TESTING

Antenna alignment and sybsystem testing occured at most terminal sites as installation was completed.

Total system testing began in September 1974, and it became quickly apparent that both S-band downlinks could not be used simultaneously. NASA granted GOT's request to use the 2670 GHz frequency for all programming, which required frequency reception changes in all S-band receivers already installed.

In October, after the start of program broadcasting, interference on ATS-1 VHF channel 4 became apparent. With NASA's permission, all Alaskan VHF units were converted to channel 3, with crystals provided by FORMS.

Aniak, Allakaket and Fairbanks had been chosen jointly by NASA and GOT as the "truth" sites in Alaska for testing ATS-6 signal strength and quality. Pointing adjustments resulted in approximately equal and acceptable levels at both Aniak and Allakaket, at opposite outer edges of the ATS-6 Alaska footprint.

MAINTENANCE

Maintenance at all 18 terminal sites was performed by GOT on an as-needed

basis, under its contract with HEW. (GOT subcontracted maintenance tasks in Fairbanks to the University of Alaska, Division of Media Services. Upon installation, the comprehensive terminal at Fort Yukon was maintained by medical experiment personnel.)

Persistent problems occured with the motorized antenna elevation units, originally designed for installation at all sites. The units were installed in Fairbanks, Juneau, Craig and Valdez. With modification kits provided by the manufacturer, there were no further failures after January 1975, but the units were not installed at any other sites.

Technical problems persisted in Craig until March 1975. The VHF unit in Galena did not operate dependably through the spring of 1975. All unit failures were returned to the manufacturer for repair or replacement, if they could not be repaired by GOT personnel in Juneau. With the lack of spare components, this occasionally left a terminal non-operational due to minor equipment failure.

The only malfunction directly attributable to cold weather occured in Fairbanks on February 11, when the S-band transmitter could not be turned on. The -20 degrees F. temperature and 20 knot winds resulted in an equivalent chill temperature of around -70 degrees F. The problem was corrected by insulating the transmitter.

VI. UTILIZATION

VI. UTILIZATION FIELD ACTIVITIES AND USER INVOLVEMENT

One basic and consistent planning concept of the ALED/ATS-6 experiment was effective utilization of the project by its rural Alaskan consumers. Program plans stressed good user liaison and involvement during all planning, operational and follow-through phases.

Three basic utilization components can be identified as actively involving field users in the ALED experiment:

1. Program Planning

   Consumer Committees, selected from footprint site residents to provide input and review during program planning and design.

2. Field Equipment Operation and Utilization

   Utilization Aides, field assistants responsible to GOT for operation of terminal equipment, local publicity, and data collection at each site.

3. Viewer Involvement

   Interaction, a component of all ALED programming allowing direct viewer response via ATS-1 VHF link.

CONSUMER COMMITTEES

In all phases of development planning for the ALED/ATS-6 experiment, GOT's concern for producing programming relevant to the rural Alaskan audience remained high. To accomplish this, GOT established consumer committees made up of ATS-6 footprint community residents to give specific input to program planning during all states of design and to insure that the committees' chosen objectives and content were

fully carried through in program production.

Instructional Programming

In late 1973 and early 1974, the GOT Utilization Manager established formal contact with village councils, local governments, school superintendents and regional Native corporations requesting the selection of one community member to serve on the three Instructional Programming consumer committees. The Alaska Division of Public Health and Alaska State-Operated School System were also asked to participate.

Selection of each committee representative was left entirely in the hands of each community or organization. Generally, selection was made by the most active and interested local organization, which varied with each village.

The committees met in February, April, June, September and November, 1974, reviewing program designs, recommending changes, suggesting culturally relevant alternatives, and approving final designs for all programs.

While first village contacts were made in writing formally requesting consumer committee participation, many of the GOT Utilization Manager's site village contacts were by telephone or in person, and this was a continuing utilization practice throughout the project.

GOT's assessment of the consumer committees was a positive one. The committees were hard working, and continued to take their responsibilities seriously.

It was also noted by GOT that nine of the village representatives were non-Native. The decision of the predominantly Native receiving sites to send non-Natives was exclusively their decision. GOT did not feel that it should have insisted that sites send only Native representatives.

Viewer-Defined Programming

In discussions with the Alaska Federation of Natives (AFN) in early January, it was suggested to the GOT Utilization Manager that representatives from the four regional corporations represented in the ATS-6 footprint sit on the content selection committee for Alaska Native Magazine (ANM).

By mid-1974, at GOT request, committee members had been selected by the Chugach and Cook Inlet Native Associations, Calista and Sealaska Corporations, Tanana Chiefs Conference, and the AFN.

Meetings were held in July, August, October, November and December 1974, and in February and March of 1975. While the production staff for ANM at KUAC-TV, Fairbanks, suggested possible programs to the consumer committee, final program topic selection was directly the responsibility of the committee.

In late 1974, as attendance at committee meetings began to drop, it became apparent to GOT that most members selected by the Native corporations spent much of their time traveling, and were not always available for meetings. Most were also Natives active and living in urban areas, with little opportunity to actually view ANM programs. This made it necessary at committee meetings to review programs already broadcast before continued planning was possible, creating some conflicts between production deadlines and the slower Native approach to decision making. These problems were worked out in coordinating meetings with KUAC and GOT.

UTILIZATION AIDES

For maximum field utilization of the ALED experiment, GOT hired and trained one community utilization aide at each terminal site.

By contract agreement with GOT each aide was paid $200 a month. Duties were defined as: 1) operating satellite terminal equipment during transmissions; 2) distributing publicity regarding the project; and 3) collecting data about audience size and participation.

All but three of the aides were hired by August 15, 1974, and a training session was held in Juneau later in the month. The GOT Technical Manager prepared an "Operator's Training Guide" for all aides, explaining equipment operation and reporting forms. The remaining three aides were hired by late 1974.

Although encouraged by GOT to submit further written reports or comments on the project and its programming, most aides did not. This could be attributed more to personalities and life styles of the individual aides, rather than to project disinterest. Several did write enthusiastically and often to GOT, but this was the exception, although most talked readily with GOT personnel during site visits.

The requirement for the aides to be present during all program broadcasts was modified after broadcast began to allow local teachers to operate the equipment for daytime Instructional Programming, causing less classroom disruption and more directly involving teachers in the project.

The daily logs were not consistently returned by all aides throughout the project. Publicity efforts also remained a problem, due in part to early scheduling changes and confusion. Advance schedules, particularly of ANM, were not always available at all sites.

At several locations (Angoon and Nenana among them) location of the TV monitor in the school negatively affected adult attendance for ANM. According to the utilization

aide's comments, some adults found the school a "foreign" and "authoritarian" place, and were reluctant to enter it. In several sites the school was located some distance from the center of the village, which was another damper on attendance.

INTERACTION

An integral component of user involvement with the ALED experiment was the interaction possible through a VHF audio link over ATS-1, enabling all sites to talk with either the Fairbanks or Juneau studios during broadcast.

The Instructional Programming series were designed to present program materials during the first 15-20 minutes, with the final 10-15 minutes devoted to questions and responses from terminal site audiences. These interaction segments were all broadcast from Juneau, with an on-camera studio teacher reviewing the material presented in the original program, asking questions, and receiving responses from the sites.

The ANM series, broadcast live from Fairbanks, was designed to answer viewer questions of the on-camera host or guests any time during the program. All other programs broadcast live over ATS-6 were also designed to accommodate viewer questions and reactions.

Utilization of interaction varied at each terminal site; some responded consistently and enthusiastically over the VHF link, some seldom, if ever, responded.

The variables of monitor location, children's attention span, teacher enthusiasm, and the audio quality of the interaction link worked to inhibit participation.

Through a basically trial and error method, the interaction teachers discovered that there was greater response to a specific question directed at one specific village, rather than asking a general question and waiting for any site to respond.

There were other problems that affected adult participation in interaction during ANM, as reported by the utilization aides. Some felt that discussion moved on too quickly before viewers could ask the questions they wanted to, and were then reluctant to break into the new discussion. Some didn't like pressing the button and speaking into a microphone. Others felt that the teachers inhibited villagers from responding.

The design of the VHF audio system required that while asking a question, sites change their audio S-band receiver channel, which allowed them to hear only the audio from the studio and avoid feedback. Thus, while one person at a site asked a question, the others at that site could not hear the question unless the studio host repeated it. This was confusing to many.

Overall, the utilization of interaction was greatest at terminal sites which had the most personal contact with GOT personnel and understood the project. The technical knowledge required to talk on the radio was minimal, but still intimidated some. From project start to end, interaction response increased, as users became more familiar with the system, and surer of themselves in using it.

VII. PROGRAM SELECTION

VII. PROGRAM SELECTION

One major component of programming planned for distribution in Alaska over ATS-6 was Instructional Programming, designed to meet the educational needs of rural Alaskan children. To best determine these needs, GOT established, early in the HET experiment planning phase, a close and continual working relationship with the Alaska Department of Education (DOE).

No formal organizational structure was established in this coordination, other than the designation of representative personnel for DOE and GOT. No decisions were made regarding Instructional Programming without consultative meetings between the two agencies. The guidelines for the formation, organization and operation of the consumer committees also grew out of these meetings.

DOE input in planning the ALED project focused on two concerns. First was the concern that the State of Alaska pays a heavy price for both rural student school experience and overall educational management. Given Alaska's frustrating geographical and communication network constraints, physical travel is used sparingly, and with little real cost efficiency. Thus, a major concern of the DOE was to establish and/or facilitate two-way communication between the among the various participants in the educational enterprise which approximated as closely as possible face-to-face communication.

DOE's second consideration in approaching the ATS-6 experiment was the possibility of gaining "hands on" experience in live video/audio communication--from a variety of viewpoints--which could be utilized to make sound decisions in relation

to the increasingly probable establishment of an Alaskan satellite communications system.

Based on a 1972 needs assessment study prepared for DOE, three critical educational needs could be identified that were particularly applicable to utilization of the ATS-6 ALED experiment:

1. Youngsters need to learn basic communication skills.
2. Learners need to learn good health habits and accurate information about sex and drugs.
3. Learners need instruction which recognizes differences in individual learning style, and they also need more options in education that are now available to them.

Although program content was focused on identified learner needs, the prime end result of the ATS-6 experiment was seen as acquisition of data regarding the feasibility of utilizing such technology to upgrade the state's educational programs rather than alleviation of an identified need. The major concern, from DOE's standpoint, was whether or not the process was viable; large gains in pupil performance were not expected within the time frame allowed.

Based on these priorities, four specific experimental program series for Instructional Programming were selected:

Early Childhood Education (ECE)

Basic Oral Language Development (BOLD)

Health Education

Teacher In-Service Training (TIST)

Specific program content for the ECE, BOLD and Health Education series were to be determined by consumer committees and the program design subcontractor, based on the general objectives determined by GOT and DOE. Full program responsibility for Teacher In-Service Training was left in the hands of the DOE.

The Public Broadcasting Programming for the ALED experiment was planned to consist of two components: Viewer-Defined Programming, and PBS/NPR Interconnect.

Viewer-Defined Programming centered around a program titled Alaska Native Magazine, to feature interviews, news and film footage on topics of interest to rural Alaskan Native adults. Program content for the first programs in the series was to be determined by a Native consumer committee, which would then set priorities for handling future topic suggestions received during the program's interaction segment.

The PBS/NPR Interconnect portion of Public Broadcasting was designed to transmit live national educational and news programming directly to all ATS-6 receiving sites, through simultaneous use of HET 1 during ALED program broadcasts on HET 2, and during Alaskan medical experiment use of HET 2.

In all program planning (with the exception of the PBS/NPR Interconnect) each series was centered on the maximum use of the VHF Interaction link between sites and transmission studios via ATS-1.

VIII. PROGRAM DESIGN

VIII. PROGRAM DESIGN

The design process of preparing programs for production varied with each programming component of the ALED project.

Instructional Programming

On December 18, 1973, GOT entered into a contract agreement with the Northwest Educational Laboratory (NWREL) in Portland, Oregon, for specified Instructional Programming design.

This contract called for production design of 32 Early Childhood Education (ECE), 64 Basic Oral Language Development (BOLD) and 64 Health Education programs, for a total of $220,457. Under this contract agreement NWREL established a program office in Anchorage, and immediately began design research and preparation of materials for presentation to the programs' consumer committees. (This original design contract did not include final script writing.)

In January 1974, GOT met with NWREL to establish guidelines of the functioning of the three consumer committees for Instructional Programming. In February a formal Memorandum of Understanding was drawn up between GOT, NWREL and program producers KUAC regarding consumer committee involvement in all phases of programming.

At the first consumer committee meetings in Juneau in mid-February, NWREL presented "Roles and Responsibilities of Consumer Committees" which, after discussion, the committees approved.

Based on its agreement with GOT allowing maximum consumer committee involvement in program design, NWREL's first presentations to the committees consistently

were in the form of alternatives to be selected. Once design goals and approaches had been chosen by the committees, NWREL presented preliminary program designs for suggestion and alteration, followed by final program designs for committee approval. This process continued through the last consumer committee meetings in November 1974, and approval of the completed final program designs. Final scripts were to be prepared by the production contractor, from these approved designs.

GOT had selected the three basic Instructional Programming areas, viewing age groups and number of programs in each series. All other program decisions were left up to the committees.

In late February, GOT modified its contract with NWREL to reduce the BOLD series from 64 to 32 programs.

The production contract was signed in mid-March, 1974, with the University of Alaska, Division of Media Services (KUAC-TV). Under this original contract, KUAC had final script writing responsibilities, requiring close coordination with NWREL and its program designs. It was agreed by both KUAC and NWREL in March that it would be impractical to have scriptwriters located in Fairbanks, since they would be working closely with NWREL in Anchorage. On the basis of this understanding, NWREL/Anchorage recruited and hired two scriptwriters in the spring of 1974, with salaries to be paid by KUAC.

The April meeting was the consumer committees first look at NWREL program designs. All committees approved of the approach use in these preliminary designs and written approval was granted for the first six preliminary designs by all three committees.

An example of the modifications made by the committees is reported in the minutes of the second BOLD meeting: one BOLD program plan called for the "use of hats of various sorts and sizes. The committee suggested that the hats used be from the different cultural areas of Alaska, e.g., a beaver hat, a spruce hat, and not just cowboy and fireman hats, etc."

In May, GOT clarified the coordination effort between GOT/Juneau, KUAC/Fairbanks and NWREL Anchorage, requesting NWREL to submit program designs to both KUAC and GOT five days prior to committee meetings, with the two contractors and GOT to meet together the day before all committee meetings.

The third consumer committee meetings were held in Fairbanks in June. Six final program designs and ten additional preliminary designs were presented to the committees by NWREL, and were approved.

In late June, KUAC prepared a written Memorandum of Understanding to NWREL, detailing the maximum talent that could be provided in program production. By contract revision effective July 15, script writing responsibility was shifted from KUAC to NWREL.

As final designs and scripts were being completed in June, GOT was informed by NIE that the FY 75 budget request was to be extensively reviewed before any funding would be awarded. This decision placed two Instructional Programs, BOLD and ECE, in a state of suspended animation, both in design and production preparation, for the remaining crucial months prior to broadcast start.

At GOT's request, NWREL submitted comprehensive project review reports on BOLD and ECE in July, to aid in NIE's review of the two series.

In July, GOT requested NIE's approval for authorizing the preparation of ten BOLD scripts scheduled for delivery by August 30, at a cost not to exceed $750. This work proceeded on the unofficial understanding from NIE that BOLD would be funded. In mid-July, all ECE design work was suspended.

NWREL's reporting procedures to GOT were formalized in early August with GOT's request for bi-monthly financial status and work performed reports, beginning August 15.

On August 23, NIE verbally informed GOT of its decision to continue support for BOLD, and to suspend all further support for ECE. That decision was altered by another telephone call to GOT from NIE in early September, temporarily suspending BOLD funding due to NIE's uncertain funding.

BOLD design did proceed, despite lack of certain funding, at GOT's understood risk. The consumer committees met as planned in September. At that meeting all committees unanimously passed a resolution urging continuing of the ECE series, with other funding if possible.

Further NWREL contract modifications were made in October and November, reducing funding due to ECE suspension.

At the final consumer committee meetings in late October all remaining final designs were approved.

The design for Teacher In-Service Training (TIST) programming was the responsibility of the Alaska Department of Education (DOE). In May of 1974 DOE established its task force for TIST to set guidelines for planning and design of the 32 half-hour program series.

On August 1, DOE contracted with an independent producer to design, script and produce the series, for a total of $6,000. As actual design work began, funding with DOE became a problem and focus of the series began to change. DOE's decision was to air a pre-produced teaching series, as well as programs using DOE resources to answer specific teacher problems relayed via interaction, and teacher-produced materials.

Viewer-Defined Programming

The format design and program topic selection for Alaska Native Magazine (ANM) was the responsibility of a consumer committee, selected at GOT's request by Alaskan Native regional corporations. Once the general topics were chosen by the committee, and KUAC production staff had the responsibility for script development, allowing maximum time for village viewer's interaction.

From the first ANM consumer committee meeting in July 1974, decisions on program format centered on establishing a positive program approach, avoiding sophisticated language that would alienate viewers. The basic format discussed and approved by the committee was to have an on-camera Native program host to interview guests and handle interaction calls, plus on-location film footage, rural Alaskan news and substantial interaction time in each program. Each show was to be centered generally around a topic of interest to the viewing Native audience.

Topic selection by the consumer committee continued through its final meeting in March of 1975.

Interaction

Interaction was the most experimental component of program design. Planning

for this segment of all programs centered on allowing maximum time for viewer reaction and input via the ATS-1 VHF link with broadcasting studios during program transmission over ATS-6.

Instructional Programming interaction was designed to follow the pre-taped programs in Health Education, BOLD and ECE. With a host teacher on-camera, questions reinforcing each program's lesson were to be asked of viewers, who could then respond verbally over ATS-1 to the interaction teacher.

Interaction for Alaska Native Magazine and TIST was designed to occur throughout each program, either through village response to specific questions, or as the site audiences asked questions of program guests or hosts.

IX. PROGRAM PRODUCTION

IX. PROGRAM PRODUCTION

The Governor's Office of Telecommunications entered into a contract agreement on March 19, 1974 with the University of Alaska, Division of Media Services (KUAC-TV) for specified ALED program production. The contract agreement of $650,223.83 called for KUAC to produce 32 programs in the ECE, BOLD, Health Education, TIST and Viewer-Defined Program series. This included set design and construction, hiring of all necessary production staff and talent, writers to complete finished scripts from NWREL designs, and Native language translators for ECE and Viewer-Defined Programming. Under this original contract, KUAC would also construct a video announce booth for interaction portions of all programming, and hire all necessary talent for interaction production.

By contract revision in July, all Instructional Programming interaction was transferred to the GOT/Juneau studio. This revised contract totaled $625,001.83, specifying that $583,355.51 of this amount was provided by NIE, with the remaining $41,646.32 provided by the Corporation for Public Broadcasting (CPB).

Both the original and revised contracts required KUAC to provide writers for completing NWREL program designs as finished scripts. This provision was transferred to NWREL as of July 15, 1974 by an October contract revision. An additional contract modification in March 1975 increased KUAC funding to allow completion of BOLD production.

INSTRUCTIONAL PROGRAMMING

Procedures for Instructional Programming production involved coordination

with program designers to assure feasibility of program designs as well as accurate production interpretation of program designs. The working relationship between KUAC and NWREL developed through a series of meetings and coorespondence between the two agencies throughout 1974 and early 1975.

In June 1974, KUAC issued a Memorandum of Understanding to BOLD and Health Education designers, detailing agreements reached on production capabilities.

The procedures established for final script approval prior to the start of program production involved NWREL's submission of final drafts of scripts to KUAC, for any necessary production changes. Copies of the scripts, with KUAC's changes, were then forwarded to NWREL and GOT, for final approval. If the KUAC changes were not approved, negotiations between the three agencies continued until the scripts were given final approval, and ready for production.

Puppet design and construction for the Instructional Programs was performed by Joe Princiotta, under subcontract to KUAC.

Early Childhood Education

In late June 1974, all production of the ECE series was suspended, due to the NIE funding review.

Health Education

Production of the Health Education series began in July, with set construction and casting completed. By August 1 the puppets had been delivered, and puppeteer training was completed. The first program was produced in early August, and two more programs were taped by the end of the month.

At its September meeting, the Health Education consumer committee had its first

opportunity to view the produced program, and reactions were positive. The puppets met with approval, as did the characterization of the health aide. A field test for the series was held in Fairbanks on August 27.

Script revision procedures and KUAC-requested changes generally resulted in several weeks delay between initial script submittal by NWREL and KUAC's receipt of a production-ready script. While this did not directly delay production, it did cut down on pre-production lead time. Although the series was behind the production schedule, it was well ahead of the broadcast schedule.

The originally-produced segments of the Health Education series (Right On!) were broadcast on Mondays. The Friday broadcast in the series was a canned health film chosen to reinforce the Monday health lesson. From NWREL suggestions and consumer committee approved selections, these films were ordered by GOT and sent directly by distributors to KUAC. KUAC then made a copy of the film, and returned the original. Following broadcast, the copy was erased.

Right On! Program #1 premiered on October 7, 1974. All 64 programs were broadcast as scheduled, with the exceptions of two canned films which GOT felt not to be suitable to the target audience. Several special broadcasts were also scheduled, to keep the series on schedule despite school holidays. The final Right On! broadcast was May 9, 1975.

Basic Oral Language Development

The June 1974 Memorandum of Understanding issued by KUAC to BOLD designers detailed the talent specifications for the BOLD series Amy and the Astros.

Pre-production preparation at KUAC continued until June 28, when notification

was received from GOT to suspend all BOLD production. This was followed on July 8 by NIE-authorized continuation of BOLD set construction not to exceed $1,000.

On this limited basis, set construction proceeded until August 23, when GOT relayed to KUAC that NIE would fund BOLD. With the September 3 notification from NIE to GOT that BOLD was again temporarily suspended, GOT made the administrative decision to proceed with full production of BOLD, to assure that the broadcast schedule could be met.

Casting for the BOLD series was completed by early September. Set construction encountered problems that delayed its completion until September 20. All puppets for the series were delivered by mid-September, over one month behind schedule.

KUAC received the first six final scripts from NWREL in late August. Four of these were reclaimed by NWREL for revision in early September, which did not directly delay production, but cut the already limited amount of pre-production lead time available. Production of the first two BOLD programs was begun September 20, and was completed one week before scheduled broadcast start.

At the final BOLD consumer committee meeting in late October 1974 members voiced disatisfaction with the series on a number of grounds: disappointment in puppet design, lack of warmth in character interaction, lack of specific storyline and musical accompaniment.

KUAC also became increasingly disatisfied with what it felt to be inadequate scripts and pre-production design consultation. In an attempt to increase communication between designers and producers, GOT coordinated a series of meetings throughout the fall and winter of 1974.

GOT remained committed to the BOLD design, and concentrated efforts on increasing communications between NWREL and KUAC. Design was committed to teaching language. Production was committed to producing an acceptably dramatic program to interest viewers, while the language was being taught. GOT felt that the differences in approach to the program series by design and production significantly contributed to communications difficulties between the two agencies.

Communications were further, consistently, hampered by time limitations and funding uncertainties. The process of turning the detailed concepts of teaching English as a second language into scripts and finished programs required extensive effort, more so than any other ALED program. Yet from the initial funding delays through to production, the demands of this coordination had to be consistently placed in the framework of deadlines and tight time limits.

The production problems eased somewhat beginning with scripts #21, attributable to both increased communication between the two agencies and an easing of production pressures.

Program #1 of Amy and the Astros premiered on October 7, with the final program broadcast May 12, 1975. All programs were broadcast as scheduled on Mondays, with repeat on Fridays. Twice, to accommodate holidays, the Friday repeat was eliminated to keep the series on schedule.

Teacher In-Service Training

The production of the Teacher In-Service Training program was performed in Juneau by GOT personnel. Production of this series differed greatly from original designs.

With broadcast, beginning on October 10, 1974, of the pre-taped lecture series, interaction response by teachers indicated strong lack of interest. Interaction was seldom used by more than a few of the rural teachers. Only one teacher-produced program was aired.

These factors resulted in major planning revisions in the fall of 1974. GOT personnel met with DOE to revise programming, with the remainder of the series centering on panel discussions and interviews of teachers involved in innovative educational projects. Interaction participation remained minimal.

This series, Tell and Show, was broadcast every Thursday, with the exception of holidays, through May 8, 1975. Only 28 programs were broadcast.

Interaction

All Instructional Programming interaction was produced in the GOT/Juneau studio by GOT personnel. Two on-camera teachers were hired by GOT, and were responsible for scripting the interaction segments of the BOLD and Health Education program series, based on program designs and the teacher's manuals for each series.

All graphics were supplied by GOT studio personnel. After program broadcast had begun, requests were made for drawings by viewing school children, and these were used consistently for both programs. Actual production time for each 10-15 minute interaction segment averaged 2 to 3 hours.

Through a basically trial-and-error method, it was discovered that the most interaction occurred when specific villages and/or children were asked specific questions, and this format was used for all interaction production.

Site-initiated questions were sporadic. Interaction was also hampered by the

poor quality of the audio circuit in Alaska, and interference from other ATS-1 users. Throughout the course of the ALED project, interaction with sites increased as viewers became more confident with the equipment, and more familiar with the programs.

VIEWER-DEFINED PROGRAMMING

For the production of Alaska Native Magazine KUAC hired a 5-member staff of cinematographers, writers and on-camera host. This staff worked closely with the ANM consumer committee. Once the general topics were selected by the committee, the production staff prepared a general program outline, began gathering film footage, and contacted potential guests and profiles. A specific script for each program, including current Alaskan news and edited film footage, was finalized just prior to the live Tuesday evening broadcasts. Program assembly throughout series production began approximately two months prior to each broadcast.

The ANM crew made over 20 field trips to Alaskan villages in the course of program preparation. KUAC provided Koyukon and Yupik simultaneous translations of prepared material with each program broadcast, but could locate no Thlinget translator in Fairbanks, so Thlinget translations could not be provided.

The ANM consumer committee's input to the program's production continued through March 1975. With the limited amount of interaction from viewers suggesting future topics, the committee continued to select subsequent program topics at each meeting.

Throughout the production of ANM, the staff made efforts to follow the guidelines and suggestions offered by the consumer committee (specifically, by including more film footage, experimenting with interaction, requesting viewer reactions in writing).

The time limits imposed by the demands of preparing each program for its scheduled broadcast made advance publicity a continuing problem. The crew's travel plans were often made on short notice. Program schedules of future programs were printed, although distribution to the sites was not consistent.

A total of 31 programs were broadcast in this series. All were one hour, with the exception of two 90-minute broadcasts. The one exception to the ANM broadcast schedule being fully met occurred on February 11 with Program #18. Due to the cold weather in Fairbanks (-70 degrees F.) the transmitter could not be turned on. This program was rebroadcast on March 27.

X. PROJECT MANAGEMENT

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The general direction for planning and management of Alaska's ATS-6 Health/Education Telecommunications ALED experiment was the responsibility of the Office of Telecommunications, within the Office of the Governor of Alaska.

C.L. Buck served as Director of GOT until his retirement December 4, 1974, and was involved in all phases of project development, negotiations, program submittals and correspondence with NIE. Marvin Weatherly became GOT Director in January 1975.

Within the GOT, specific responsibility for the ATS-6 ALED program experiment was assigned to Dr. Charles Northrip, Satellite Experiment Coordinator. The Coordinator had overall responsibility for continued planning and conduct of the ALED experiment in Alaska, and for liaison with federal and state agencies as well as with all other participants in the demonstration.

Rex Taylor, the Education Experiment Manager, was responsible for the detailed planning, organization and successful conduct of the educational programming experiments. These responsibilities included the supervision and coordination of the program design and production contractors. Additional duties involved liaison with the Alaska Department of Education, and coordination of all Instructional Programming consumer committee meetings.

The Utilization Manager was responsible for selecting and training utilization aides and for insuring that the field structure necessary for successful program implementation was maintained. The Utilization Manager also coordinated GOT's contact and liaison with site communities, Native regional corporations and Viewer-

Defined Programming consumer committee members. This position was held from November 1, 1973 to March 19, 1974 by Melvin Charlie. Ronald Solomon was hired May 6 to June 7, 1974. Catalino Barril became the third and final Utilization Manager on July 8, 1974.

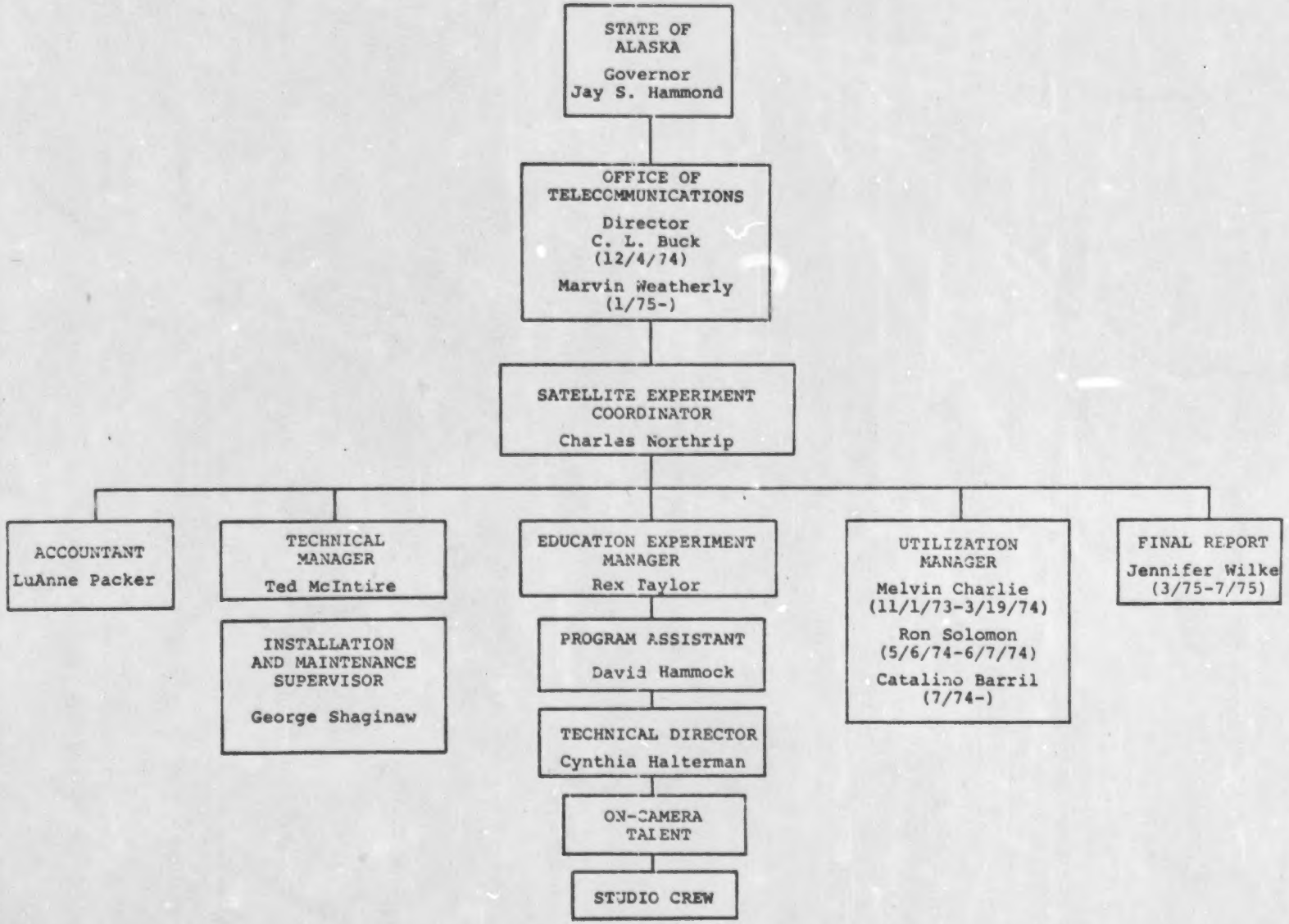
Ted McIntire, the Technical Manager, was responsible for planning the installation of the satellite earth terminals and related equipment, and for operation and maintenance of the system. He served as GOT's liaison with the broadcast and engineering components of the FORMS Network Control Center in Denver, and with operations personnel at ATSOCC. He was also responsible for supervision of the maintenance subcontractor. GOT's Installation and Maintenance Supervisor, George Shaginaw, was under the Technical Manager's direction, as were the temporary workers and subcontractors during the installation phase of ATS-6 HET operations.

The structure of Alaska ATS-6 HET project management is shown in Figure 2.

Program design for BOLD, ECE (until suspended) and Health Education was accomplished by NWREL, under a contract agreement with GOT specifying work to be performed and required reporting procedures, under the supervision of the Education Experiment Manager.

GOT found this working relationship consistently good, with NWREL committed to meeting project deadlines and consumer committee guidelines, and willing to negotiate difficulties that developed. The location of NWREL offices in Anchorage and Portland necessitated some additional travel for coordination meetings, but direct telephone contact was maintained throughout the project, with written verification following all verbal decisions and agreements.

Figure 2. GOT Organizational Chart



Program design for all Instructional and Viewer-Defined Programming was accomplished with input from consumer committees selected by participating site communities and Native regional corporations, at GOT request. The meetings of all committees were coordinated and paid for by GOT, which prepared all agendas and provided all travel arrangements. The committees were hard-working and seriously committed to fulfilling their responsibilities for program design.

GOT's production contract with the University of Alaska, KUAC-TV, supervised by the Education Experiment Manager, specified all work to be performed in the production of BOLD, ECE (until suspended), Health Education and Viewer-Defined Programming. Coordination with NWREL for Instructional Programming design consistent with KUAC production capabilities was a continual process. Production difficulties encountered were negotiated with NWREL through GOT, with consistent encouragement for direct contact between the two agencies.

Overall, GOT felt KUAC to be committed to providing the best quality production possible within its means. Given the time restraints on performance, and the funding uncertainties for major components of Instructional Programming, KUAC performed its production responsibilities to GOT's satisfaction.

All utilization working relationships centered on contact, (verbal, written and personal) with experiment users.

Selection of utilization aides was made by site communities at GOT's request. The performance of the aides was generally satisfactory, given the differences in personalities, and each village's existing communications facilities (more input was received where telephone communications were possible). The daily logs were not

returned consistently by some aides, and written comments were generally minimal, although the Utilization Manager kept in verbal contact with many and received continuing input from them.

Site visits by GOT personnel were conducted throughout the project in an effort to acquaint villages with the ATS-6 project and to encourage both school and village resident's participation in the project.

Installation management was plagued by late delivery of equipment, occasionally encountering delays due to transportation difficulties. Actual installation was performed by GOT Technical Manager and staff, with assistance at some sites by the ASOSS Maintenance Department, the State Division of Buildings, and temporary GOT employees. GOT also supervised installation and maintenance accomplishment in Fairbanks, performed by the University of Alaska under contract agreement with GOT. Installation was provided in Valdez and Yakutat by Glen Mills Construction and Wire Communications, Inc.

GOT installation management had to continually cope with planning partial installations, to make as many sites operational as possible with available equipment. Maintenance, performed on an as-needed basis, was also greatly hampered by the lack of spare components parts.

Technical testing of the ATS-6 ALED network was performed in September 1974. The interference encountered with the simultaneous use of the two S-band downlinks caused GOT to request permission from NASA for use of the 2670 GHz frequency exclusively, which necessitated adjustments of equipment already installed.

VHF interference on ATS-1 that became obvious in October again required GOT

to request NASA's permission to convert all Alaskan VHF unit reception capabilities. FORMS provided the new crystals, and installation was accomplished by GOT personnel.

Scheduling for ALED's use of ATS-6 was determined by NASA, through HEW, for ALED's approval. By February 1974, project management received a permanent transmission schedule, giving ALED 4 hours and 45 minutes per week. The only NASA-initiated change in ALED's transmission schedule occurred in late October, with the loss of 15 minutes on every third Thursday, and a later Thursday broadcast start time. All ALED requests to NASA for transmission changes were made verbally to ATSOCC by GOT technical personnel.

The interface required of GOT for actual ATS-6 broadcast was all performed verbally with the Federation of Rocky Mountain States Network Control Center in Denver, via ATS-1.

An internal Alaskan program evaluation was included in GOT's FY 1974 budget, and a request for proposals was issued in May 1974. Due to reduced funding for FY 1975, the evaluation contract was never awarded. GOT's reporting on overall project achievement was specified in the August FY 1975 NIE grant award to include a Final Report documenting GOT's participation in the ATS-6 HET experiment, to be submitted to NIE by September 30, 1975. Additional reporting procedures required by NIE included Bi-Weekly Milestone Completion Reports, beginning August 15, 1974, Monthly Financial Reports, and videotape cassette duplicates of all Instructional and Viewer-Defined Programming.

Throughout ALED program development, negotiations with NIE necessitated substantial management personnel time. This requirement did not lessen, but in fact

increased in the crucial months just prior to and during program broadcast start. GOT's FY 1975 request of $840,000, submitted in March 1974, was not granted pending a review of ECE and BOLD program designs. The decision by NIE in late August to support BOLD but suspend ECE support was reversed in early September when funding for BOLD was again temporarily suspended due to uncertain NIE funding. With NIE approval, GOT continued BOLD production to meet broadcast deadlines, but did not receive assurance of BOLD funding until December 1974, two months after broadcast start.

Time limitations were another major factor in all management aspects of this project. As a result, much negotiation and communication with NIE was conducted by telephone, with written confirmation usually (but not always) following verbal decisions. The time limits already imposed on the project to meet its fall 1974 broadcast deadlines were greatly tightened by the funding problems, which drastically cut design and production lead time.

Clearly, the funding uncertainties placed strain on every phase of program development in the summer and fall of 1974. These funding changes also required GOT's modification of both production and design contract agreements.

XI. RECOMMENDATIONS

XI. RECOMMENDATIONS

SYSTEM DESIGN

Based on the state's experience with the ATS-6 satellite system, it is recommended that the Alaska Governor's Office of Telecommunications be represented during the system specification phase of any future satellite operational system design.

The GOT, based on its experimental use of ATS-6, recommends that increased usefulness would be provided if future satellite systems included at least the following technical capabilities:

1. Two video channels with four high quality phase-related audio channels, each with uplink frequencies useable in Alaska.

2. As many single channel per carrier voice channels as possible, to work between low-cost earth terminals. At least one of the audio channels should be designated solely for system control and coordination.

3. Ability to work with low-cost (10-foot) earth terminals capable of receiving either or both of two television channels, and of transmitting and receiving voice on either/any of two or more channels.

4. A footprint giving full coverage of the state.

5. Full-time satellite availability for service, including eclipse protection.

SYSTEM OPERATION

For future satellite communications systems, the satellite technical control center, particularly if located outside Alaska, should have a direct means of communication with a network control center located in Alaska. In addition, the Alaska network

control center should be provided with equipment and personnel necessary to carry out technical and operational monitoring of the system.

SITE SELECTION

Future site selection should include Native regional corporation recommendations, and should directly allow all potential sites to make their own decision of whether they wish to participate or not. Since the potential impact of such a system on village life could be quite substantial, all state planning should incorporate a means of villages to consciously and clearly choose to participate.

INSTALLATION

1. Site surveys should be conducted at all terminal locations well ahead of actual installation and final site selection, to assess the best possible antenna and receive equipment locations.

2. Equipment procurement for future systems should be performed with maximum lead time possible, to allow efficient, on-schedule installation accomplishment.

3. Close coordination with both local school authorities and village councils is vital to insure the most practical and useful placement of viewing monitors. It is recommended that a minimum of two monitors be placed in each village, one in the community hall and one in an appropriate school classroom. Maximum use of educational programming could be made with placement of monitors in every classroom.

4. Installation planning must flexibly accommodate to the variable weather conditions in Alaska, as well as the accessibility of each individual location.

5. Future communications networks in the state should plan to provide a minimum of 10% additional complete electronics components as replacement spares.

6. In future state networks, the satellite should be available for system testing as each terminal is installed, with satellite ground support fully operational as well.

UTILIZATION AND USER INVOLVEMENT

1. For future state satellite programming efforts, the GOT strongly recommends continued utilization of the consumer committee concept, to directly involve village users in program design and planning. The committees should remain active throughout the production phase of any future project.

2. Paid, trained and supervised utilization aides at each terminal location should be a continuing component of all future communication networks in the state.

3. Two-way audio interaction should remain an option of future systems.

4. Village participant selection should be coordinated through village councils or Native regional corporations.

5. In coordinating with Native regional corporations, it is recommended that requests be made for counselors or trainers, people that work at the "grass roots level," to act as corporation representatives.

6. Maximum use of all fixed-time educational broadcasts could be made by rural teachers if VTR equipment was available at all sites for recording programs.

7. Program scheduling should allow repeat program broadcasts if more than one hour difference in time zones exists among receiving sites.

8. With well-trained and informed utilization aides and teachers in each receiving site, the utilization of a future satellite network could provide a cost-effective means for providing a wide variety of state agency training programs directly to Alaskan rural residents.

PROGRAMMING

1. To acquire needed expertise in instructional media presentation, it is recommended that educational program design for future broadcast systems be performed by an experienced educational planning agency, under contract to project management.

2. Design of educational programming should also involve close and consistent coordination with the rural educators who will be receiving the programs.

3. Prior to program broadcast start, a clearly outlined plan of field testing viewer reactions to all programs should be implemented.

4. Programming that offers simultaneous Native translations during broadcast should be utilized in future systems, providing translations of all program material, not only segments.

5. Future program planning should be approached imaginatively, and not be limited to the standard concepts of television program presentation.

PROJECT MANAGEMENT

1. GOT strongly recommends that future satellite program funding be finalized for all programs a minimum of six months prior to broadcast start, and that all commitments with funding agencies be made in writing at all times.

2. Management of future program development should include frequent coordination meetings between program designers, scriptwriters and producers, particularly during development and initial production phases.

3. To facilitate program development, producers should be funded for coordination input with designers at the start of program design. For adequate preparation time prior to production, the production contract should be finalized a minimum of

nine months (preferably 12) prior to scheduled broadcast start.

4. Production of programs for future systems should include technical training for Alaska Natives.

5. Coordination of the utilization of educational programming should be established between future project management and a central state education agency (such as the Alaska DOE, or ASOSS).

6. An active and consistent public information effort is essential to encourage user participation in any future satellite communications network.

7. Management for future satellite programming systems throughout Alaska should include a communications advisory board consisting of Native leaders, educators from DOE, ASOSS and BIA.

8. Evaluation efforts for subsequent projects should approach with care the selection of personnel involved in village visits and evaluation of village reactions.

XII. SUMMARY

XII. SUMMARY

The ATS-6 ALED project was a unique experiment--a first opportunity for the State of Alaska to gain the experience of operating a satellite programming network. The experiment provided a first-hand demonstration of the practicality of media technology in meeting the communications needs imposed by Alaska's rugged terrain, harsh climate and sparse population.

The experiment was a model for gauging the appropriateness of using satellite communications for instructional purposes, and for developing programming content specifically designed to be relevant to the needs of rural Alaskan residents, both student and adult. It further demonstrated the potential importance of satellite television programming in supplementing and supporting the instructional resources of Alaska's rural classroom teachers.

As a result of this experiment, GOT gained experience in a wide variety of areas directly relevant to the planning of a future statewide operational satellite network.

Earth terminal equipment was installed by GOT in 19 widely scattered communities throughout the state, Over 1,000 miles separates the northernmost experiment site, Allakaket, with Craig, the southernmost community in the ALED footprint. The problems encountered in installation due to the isolation of site communities, limited transportation and variable weather conditions provided valuable input for future communication systems installation planning. None of the 25 S-band antennas in use failed during the project, despite weather conditions, and none were damaged. Temperatures to -60 degrees F. did not impair receive terminal operation, and only one equipment failure was directly attributable to colder weather. Antenna installation in several communities

required special preparation due to ground conditions and winter snow accumulation.

Fourteen terminal sites were rural Alaskan villages with an average population of less than 250. Alaska's ATS-6 ALED footprint included villages with substantial populations speaking, in addition to English, Central Yupik Eskimo, Thlinget and five Athabaskan dialects. The experiment presented GOT with the challenge of coordinating input from the culturally diverse footprint population in designing and producing culturally relevant programming. All community participants were selected by their own communities or one of the four Native regional corporations represented within the footprint. Utilization of ALED programming was further coordinated with local schools and village councils, as well as through the 15 aides hired and trained in the operation of all site terminal equipment.

This experiment also involved GOT in coordinated working relationships with other state agencies, in developing programs for distribution over ATS-6. Instructional programming subject areas were based on the Alaska Department of Education's priority of needs for Alaska rural children and the Department of Education provided continuing input throughout the project. Experiments of Opportunity program development directly involved the Alaska Department of Community and Regional Affairs, the Alaska State Library, and the Alaska Department of Fish and Game.

Instructional Programming design was accomplished for GOT by a contracted professional educational design agency, with continuing guidance from two 10-member committees of Alaskan program consumers. All programs were produced for GOT by an Alaskan professional television production facility.

In less than one full year of planning, 100 hours of original television programming

were designed, and production and broadcast began. Instructional programs were available to 1200 rural school children (K-5th grade), and 150 rural Alaskan educators. Viewer-Defined Programming was accessible to 9,000 Alaskan village residents, young and old, as well as to the 50,000 urban residents of Fairbanks.

The ALED project gave GOT a first-time experience in the operation of an interactive satellite communication system, providing an innovative and direct means of viewer feedback. Another unique feature of the project was the experimentation with simultaneous broadcasts in English and two Alaskan Native languages.

The technical interface required with NASA and NCC provided GOT with useful experience in the day-to-day coordination and scheduling of real-time satellite broadcasting. The operation of the system resulted in specific technical recommendations for future system equipment design and capabilities.

The ATS-6 ALED experiment was a model learning experience for the state. Both the successes and the mistakes of this experiment were valuable to the continued sophistication of Alaska's development of the most practical, useful and effective future operational satellite system for the state.

A full external evaluation of this project is being prepared for NIE by Practical Concepts, Inc., with assistance from the Center for Northern Educational Research. In GOT's view, one of the most important aspects of this experiment has been the consumer input and reaction during all phases of development. In spite of difficulties encountered and the short time span of this project, site participants have expressed the hope that the project could continue, and expand:

> In behalf of the school board we would like another ATS-6 project

to continue next year. The school children really enjoy the program and they also like to communicate on the satellite.

--School Board Chairman, Nikolai

I'm going out to get some signatures on a petition that we keep ATS-6 in McGrath next year...

--Utilization Aide, McGrath

The satellite TV reaches many in a way that radio and regular TV could not and we of Valdez are glad that we are part of the whole program.

--Utilization Aide, Valdez

We sure would like to have another ATS-6 project next year. The school children have more interest in school now. They look forward to watching TV. They really enjoy it and it's very educational.

--Village council President, Nikolai

It has been very rewarding to see the very positive and beneficial results (of the Health Education series)...If extended and expanded, (the ATS-6 project could) change the educational face of Alaska and broaden the educational concepts of the entire nation. I feel confident this concern is shared by the teachers and students of rural Alaska as well.

--Chairman, Health Education consumer committee

The potentials for satellite communications in Alaska are beginning to be discovered by planners and users alike.